ENERGY OPTIONS

OVERVIEW PAPER

INDUSTRIAL SECTOR-

Forest Products

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1. INTRODUCTION

With the rising price of oil and other fuels and the availability of modern chipping, handling and combustion equipment, wood residues are coming to be regarded by forest products companies as a valuable by-product. Either on their own or in combination with mill wastes, these residues are leading to a new line of business for forest companies--the supply of wood fuel to various local users. The major new sources of wood residues are wood harvesting and non-marketable timber. Previously, both of these residues were left in the forest or had to be cleared away at a substantial cost to make way for reforestation.

Lessons valuable to any business considering going into wood fuel supply can be learned from projects assisted by the Federal/Provincial Conservation and Renewable Energy Demonstration Agreements (CREDA) program which investigated the creation of an infrastructure to supply this new fuel. Further initiatives to establish wood residue as a fuel supply should be guided by the lessons learned from these demonstrations and should take advantage of the resources now available to facilitate implementation.

2. CREDA DEMONSTRATIONS

Four CREDA supported projects investigated the potential for the establishment of a wood energy supply industry. Although all four projects are located on the east coast they provide valuable examples for operations established in other provinces. A detailed description of each project is provided in the ENEROPTIONS Case Studies attached. A brief outline of each of them is provided below.

NFLD 12 Whole Tree Chipping for Fuel - Abitibi Price, Grand Falls, Newfoundland

This project demonstrated and evaluated a complete harvesting -chipping-transportation system for the burning of hardwoods as an alternative to Bunker C oil in a pulp and paper mill. A saving of $86,000 was achieved by replacing 16,071 barrels of oil with wood chips.

NFLD 23 Fuelwood Supply Evaluation - Bonavista Peninsula, Newfoundland

This study assessed the supply of fuelwood -- both mill residue and forest biomass -- in the Bonavista Penninsula of Newfoundland and established the production cost of wood chips. The study concluded that the projected demand for wood chips would be 15,000 green tonnes (16,535 tons) of chips per year which could be met at a cost of $27.40 per green tonne ($24.85 per ton) or $49.81 per dried tonne ($45.18 per ton).

NB 59 + 78 Wood Supply Infrastructure--New Brunswick

These two studies examined the supply and demand for wood fuel derived from logging residues and the opportunities for the establishment of a wood energy supply industry. Findings indicated that various institutions and industries could support the establishment of businesses supplying wood chips, sawmill residue, and roundwood (semi-processd wood fuels) at an attractive return on investment.

NB 68 Harvesting Forest Residue - Repap Miramichi Forest Products, Newcastle, New Brunswick

This project involved the clear cutting of 135 hectares (334 acres) of low quality timber stands. Once marketable wood was removed, all remaining trees and cuttings were chipped on-site using a mobile chipper, forwarder and chip bin and then trans-

ported 16 km (10 mi) to a pulp mill for use as hog fuel. Annual savings of over $190,000 were realized from the use of the wood chips and reductions of $13,500 were achieved in preparation costs for the site prior to replanting.

Many other forest products projects have been undertaken. Contact your nearest federal or provincial energy office to learn more about nearby projects or those in applications similar to yours.

The viability of the demand side of wood energy has been proven. The ENEROPTIONS Wood Burning package describes projects which create a market for wood residue, including projects financed from savings alone and installed on a turnkey basis.

3. LESSONS LEARNED

Competitive Position. The harvesting, processing and transportation of forest residues can be performed at a delivered cost that is lower than the cost of oil and electricity used for heat. In some cases, wood residue is competitive with the market value of hog fuel from mills. A critical factor affecting the delivered cost, however, is the trucking distance from site to point of use. Using equipment currently available, any distance over 100 km begins to render forest residue uncompetitive.

Hidden Economic Benefits. There are significant hidden advantages to the harvesting of forest residues. In some cases, the value of the residues makes the cutting of merchantable trees economic on a stand of trees that would otherwise be uneconomic to harvest. In other cases, the use and sale of non-merchantable trees and scrub subsidizes the cost of clearing and preparing the site for reforestation.

Delivered Cost. Green wood chips can be delivered at a cost of between $20 and $30 per tonne ($18 to $27 per ton) depending on equipment reliability and the value placed on clearing land for reforestation.

Chipper Efficiency. It was found that production increased if the mobile chipper was kept at the roadside and was fed by a forwarder rather than bringing the chipper into the forest. Another method of improving efficiency of the chipper is to use chip storage bins which allow for continuous operation of the chipper while the truck is away on delivery. Several factors contribute to decreased chipper efficiency. Logs pick up considerable amounts of soil and rock during skidding which leads to increased jamming and maintenance of the chipper. Similarly, chopping during wet or snowy weather was more difficult due to much higher moisture content in the forest residue.

Supply and Demand. Any potential wood fuel supply business should be preceded by a thorough assessment of sources of supply and markets within the subject region. Potential markets for wood fuel include most industrial, commercial and institutional establishments currently using oil or electricity to produce steam or low-temperature heat. Special consideration should be given to medium-sized industries of various types: schools, hospitals, prisons, greenhouses, nursing homes and district heating plants. A separate market for cordwood or, in certain circumstances, wood-chips, may exist among residential users. It appears the most attractive business opportunities are:

- wood-chip supply (green wood-chips from forest residues)
- sawmill residue supply (bark and sawdust)
- fuelwood supply (cordwood in various lengths from 2.4 m (8 ft) to 4.9 m (16 ft) mostly for the residential sector)

There are major and profitable opportunities for new businesses and for the extension of traditional forest industries into wood fuel supply.

Supply assessments should examine the full range of sources from forest residues to waste from wood products. In most cases studied to date, wood fuel can supply a significant portion of local oil and electrical needs (10% to 30%) and use only a portion of the available economic supply of wood residue (from 29% to 50%).

Infrastructure Needs. Past experience has demonstrated a need for vertical integration of the wood residue supply industry. Specifically, suppliers of wood fuel should also provide analysis, advice and instal-

lation of handling and combustion equipment so that the buyer is able to obtain a complete service from one company.

4. NEXT STEPS

If you are considering supplying wood residue for use as a fuel as described in the materials presented in this and the Wood Burning ENEROPTIONS packages, you should consider the "next steps" suggested below.

- read the case studies enclosed and obtain background technical reports on each

- undertake a survey of the market for wood fuel

- investigate the availability of wood residue supply including:

  - forest residues (unmarketable species, damaged stands, remote stands, harvesting residue)
  - residues from saw and lumber mills
  - pulp mill residues
  - waste from wood products industries (e.g., furniture, veneer)

- perform an economic analysis of business viability

5. RESOURCES AVAILABLE

Technical reports are available free of charge for most of the CREDA projects listed above. Addresses of appropriate contacts for follow-up, including equipment suppliers and system designers, are listed at the end of each of the attached ENEROPTIONS Case Studies under the "Further Information" section.

The Conservation and Renewable Energy Offices (CREOs) of Energy, Mines and Resources (EMR) Canada in each province and territory have information on

federal demonstrations and other assistance programs. Check the back of the attached file folder to locate the CREO in your area.

The departments or ministries of energy in each province or territory have information on energy conservation and alternative energy and may have assistance programs. Check your telephone directory for appropriate contact people.

The Task Force on Forest Products is another source of information, available through:

Task Force Programs
(Re: ENEROPTIONS)
Industrial Energy Division
Energy Conservation and Oil Substitution Branch
Energy, Mines and Resources Canada
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